

Remarks

Status of the Application

The Office rejected all claims outstanding as of the last amendment. Applicant appealed the rejections, and the Board of Patent Appeals and Interferences affirmed the rejections.

Applicant has amended certain of the claims in light of the rejections and the BPAI's decision, and presents remarks below relative to the amendments in light of the BPAI's decision and the references.

Claim 3, and Claims 4-13, 15-24, 26-32, and 34 dependent on Claim 3

Claim 3. The Office rejected these claims under 35 U.S.C. 102 as anticipated by *Rosenberg*, *Stewart*, or under 35 U.S.C. 103 based on various combinations of *Rosenberg* with other references. Since the amendments offered to the claims primarily relate to limitations which the Office found in *Rosenberg*, the discussion below generally concerns the relation of the various claims to *Rosenberg* or *Stewart*.

The Office cited *Rosenberg's* teaching of a groove for guiding movement of a cursor and *Rosenberg's* teaching of provision of force feedback when a cursor crosses window boundaries. Applicant, in the previous response and in the Appeal Brief, argued that the invention of Claim 3 was capable of communicating to the user forces responsive to interaction with the application while the user is moving an input device along a device fundamental path, while *Rosenberg* had no teaching of such a combination. The BPAI indicated that Claim 3 was not limited to such an embodiment, however, and accordingly affirmed the rejection. Applicant has amended Claim 3 to explicitly include the limitation that forces be communicated to the user while the user is moving an input device along a device fundamental path, and submits that the corresponding rejection has been overcome.

The Office also rejected Claim 3 under 35 U.S.C. 102 as anticipated by *Stewart*. Applicant, in the previous response and in the Appeal Brief, argued that the invention of Claim 3 allowed the simultaneous application of forces that encourage the device to remain on the device fundamental path and forces that relate to interaction with the application (steps e and f of the previous Claim 3). The BPAI indicated that Claim 3 was not limited to such an embodiment, however, and accordingly affirmed the rejection.

Applicant has amended Claim 3, combining steps e and f and explicitly reciting the limitation that the two forces are applied simultaneously, and submits that the corresponding rejection has been overcome.

Applicant submits that Claim 3, and Claims 4-13, 15-24, 26-32, and 34 depending therefrom, are in condition for allowance.

Claims 21-22, dependent on Claim 3. Claims 21-22 have limitations not taught by the art, in addition to those previously argued relative to parent Claim 3. Applicant argued that *Rosenberg* did not teach a force

that was dependent on the device's position along the device fundamental path. The BPAI stated that *Rosenberg's* centering force would be at least partly dependent on the device's position along the device fundamental path. While Applicant maintains that *Rosenberg's* centering force is only dependent on the device's position off the path (or normal to the path), Applicant has amended Claims 21-22 to explicitly recite that the second force (the one due to interaction with the application) has a component along the device path (orthogonal to the centering force taught by *Rosenberg*). Applicant submits that the corresponding rejection has been overcome, and that Claims 21-22 are in condition for allowance.

Claim 23, dependent on Claim 3, and Claim 24, dependent on Claim 23. Claim 23 has limitations not taught by the art, in addition to those previously argued relative to parent Claim 3. Applicant argued that *Rosenberg* did not teach a force that was variable responsive to a user-assistance parameter. The BPAI stated that *Rosenberg's* ability to disable the haptics taught that limitation, since turning off the haptics provided one value of *Rosenberg's* centering force (zero), while enabling the haptics would provide a second value of *Rosenberg's* centering force. Applicant has amended Claim 23 to explicitly recite that the user-assistance parameter corresponds to at least two non-zero forces. The invention of Claim 23 accordingly allows the interface to determine how much haptic assistance to provide to a user, in contrast to the BPAI's reading of *Rosenberg* that provided only "haptics on" or "haptics off" capabilities, and had no mention of any user-assistance parameter that affected the magnitude of haptic assistance. Applicant submits that the corresponding rejection has been overcome, and that Claim 23, and Claim 24 depending therefrom, are in condition for allowance.

Claim 26, dependent on Claim 3, and Claims 27-30, dependent on Claim 26. Claim 26 has limitations not taught by the art, in addition to those previously argued relative to parent Claim 3. The invention of Claim 26 was intended to encompass an embodiment where the user could move the object to any of many places and initiate an object fundamental path relative to the object position at the time the path was initiated, removing the need for the user to precisely position the object at a predefined starting point. The BPAI stated that, if positioning *Rosenberg's* cursor at the beginning of a groove was considered the motion-initiation signal, then *Rosenberg* taught the limitations of previous Claim 26. Applicant has amended Claim 26 to explicitly recite the limitation that the motion-initiation signal comprise something other than positioning the cursor within the predefined groove. Since *Rosenberg* relies on grooves residing at predefined regions, this limitation would not be compatible with *Rosenberg's* teaching. Applicant submits that the corresponding rejection has been overcome, and that Claim 26, and Claims 27-30 depending therefrom, are in condition for allowance.

Claim 28, dependent on Claim 26, and Claim 29, dependent on Claim 28. Claim 28 has limitations not taught by the art, in addition to those previously argued relative to parent Claims 26 and 3. The invention of Claim 28 recited the limitation that the motion-initiation signal comprised a switch. The BPAI stated that, positioning *Rosenberg's* cursor at the beginning of a groove could be considered a switch. Applicant has amended Claim 28 to explicitly recite the limitation that the switch comprises a hardware switch, not taught by Rosenberg or needed by *Rosenberg* since *Rosenberg's* groove is always initiated by positioning the cursor in the groove. Applicant submits that the corresponding rejection has been overcome, and that Claim 28, and Claim 29 depending therefrom, are in condition for allowance.

Claim 14, and Claim 25 dependent on Claim 14

Applicant argued that Rosenberg did not teach a force urging the input device to a region of its range of motion based on the object path. The BPAI stated that the claim included embodiments that read on *Rosenberg's* teaching of an autocentering mouse. Applicant has amended Claim 14 to explicitly recite the limitation that the input device be urged to a starting region such that the input device will be able to move the object along the full object fundamental path without requiring motion of the input device, outside of its range of motion. *Rosenberg's* autocentering mouse does not consider any such dependence on path. Indeed, in applications where the object path requires motion of the device more than one half its range of motion, *Rosenberg's* autocentered mouse would never be able to accommodate object motion along the full object path. Applicant submits that the corresponding rejection has been overcome and that Claim 14, and Claim 25 depending therefrom, are in condition for allowance.

Claim 35, and Claims 36-37 dependent on Claim 35

The Office rejected these claims as anticipated by *Stewart*, which teaches a system having a haptic surface with a graphical representation of an input device interacting with the surface. The BPAI stated that the surface and the input device in *Stewart* could be considered physical objects represented in the simulated world, and that *Stewart* accordingly taught the elements of previous Claim 35. The invention of Claim 35, however, is extensible to systems where multiple objects are interacting. Applicant has amended Claim 35 to explicitly recite that the system simulates three or more objects, including interactions among at least three of such objects. *Stewart* is concerned solely with the interaction of a single user input device/object with a haptic surface, and has no mention of more objects interacting in a simulation that include haptic control by a user as in Claim 35. Applicant submits that the corresponding rejection has been overcome, and that Claim 35, and Claims 36-37 depending therefrom, are in condition for allowance.